

ART. XLV.—Notes on the Whales of the New Zealand Seas.

By JAMES HECTOR, C.M.G., M.D., F.R.S.

Plates XVI. and XVII.

[Read before the Wellington Philosophical Society, 12th January, 1878.]

HAVING lately had an opportunity of examining various type specimens of our Cetaceans in the European museums, and of consulting important books of reference on this branch of our zoology, especially the magnificent work of Professors Van Beneden and Gervais,* I am enabled to offer a few critical notes on some of the species in continuation of my former papers to the Society,† and in anticipation of a complete review of the species now described from New Zealand, showing the present state of our knowledge on this subject.

1. NEOBALÆNA MARGINATA.

Neobalæna marginata, Gray; Supp. Cat. Seals and Whales, p. 41; Hector, Trans. N.Z. Inst., II., 26, (skull); V., pl. 6 (ear-bones); VII., 251, pl. 17 (external form and complete skeleton).

This species having by one author‡ been treated as a synonym of *Eubalæna australis*, or the black whale, I have compared the skeletons of young individuals, as I presume that, from its small size, it has been taken for the young of the latter species.

Only three examples of *Neobalæna* are known:—

a. The original type from Kawau Island, presented to the Colonial Museum by Sir George Grey, and of which only the skull was preserved, measuring 57 § inches in length. This is the largest specimen yet met with, and the proportionate length of the animal would be 20 feet.

b. A complete skeleton 14 feet 6 inches long, obtained ||by Mr. Charles Traill on Stewart Island, and now in the British Museum, and of which the skull measures 41 inches.

c. Skull of a very young individual in the Auckland Museum, measuring 35 inches.¶

In each of these specimens the baleen is present with the characteristic elongated form, fine texture, and yellow colour with a black margin, and the other details of the skull and form of the ear-bones also agree closely, exhibiting only differences of growth.

* Ostéographie des Cétacés vivants et fossiles: 4to., with atlas of plates, folio. Paris. 13 parts published.

† Trans. N.Z. Institute, II., 26; III., 128; V., 154; VI., 86; VII., 251; IX., 477.

‡ A. W. Scott, M.A., Mammalia, recent and extinct—Section PINNATA. Sydney, 1873.

§ Trans. N.Z. Inst., II., 26. || Trans. N.Z. Inst., VII., 253.

¶ Trans. N.Z. Inst., VII., 251.

With the last-mentioned specimen I was able to compare the skull of a young calf of *Eubalæna australis*, the complete skeleton being in the College of Surgeons Museum, London, and 12 feet in total length, the skull measuring 36 inches, and the difference in the cranial characters of the two species is found to be quite as obvious as in the more fully developed skulls. The general outline of the two skulls at once distinguishes them. In *Neobalæna* the greatest width is across the hinder border which is also concave in outline, owing to the projection backwards and outwards of the exoccipitals and squamosals, whereas in *Eubalæna* the greatest width is across the orbital plates of the frontals, so that the posterior half of the skull is convex in outline.

In *Neobalæna* the skull is less arched, the length being four times the height of the arch between the glenoid processes and the tip of the beak, and the supra-occipital is a narrow bone with a strong median ridge extending forwards for half the total length of the skull; but in the young *Eubalæna* the height is equal to two-fifths the length, and the supra-occipital has a circular outline, is flat, and extends over only one-fourth of the arch of the skull.

It is obvious that even at the earliest age these crania present marked differences, while the divergence exhibited in the other osteological characters is still more striking. Thus comparing the complete skeleton of *Neobalæna*, 14 feet 6 inches in length, with *Eubalæna*, we have—

	<i>Neobalæna.</i>			<i>Eubalæna.</i>		
Cervicals	7	..	..	7	..	..
Dorsals	15	..	..	15	..	..
Lumbar	6	..	..	12	..	..
Caudals (with chevrons) ..	6	..	..	10	..	..
„ (without chevrons) 10	..	..	..	15	..	..
	—			—		
	44			59		

In *Neobalæna* the scapula is nearly twice as wide as high with strong coracoid and acromion processes, almost as in *Balænoptera*. In *Eubalæna*, on the contrary, the scapula is high and narrow and with only one feeble process. In the form of the vertebræ, sternal apparatus, and especially in the quality and proportional dimensions of the baleen, *Neobalæna* has some affinity with the right-whale (*Mysticete*) of the Arctic Seas, and it is not unlikely that it may be a species abounding in the unexplored seas of far southern latitudes, where it may attain to a large size, only stragglers occasionally reaching to the latitude of New Zealand and Australia. In these seas the normal representative of the *Balænidæ* is *Eubalæna australis*, just as in the northern hemisphere *Eubalæna biscayensis* in the temperate latitudes of the Atlantic, and *E. japonica*, of the Pacific, replace the *Mysticete* of the

Arctic regions. If such be the case it will have an interesting bearing on the distribution of the Cetacea, that the forms of temperate latitudes (*Eubalæna*) should present less divergent characters than the Arctic and Antarctic representative forms.

2. EUBALÆNA AUSTRALIS.

Balæna australis, Desmoulins; Dict. Class. H.N., II., 161.

Balæna antipodarum, Gray; Dieffenbach's N.Z., II., 183; v. Beneden and Gervais, Ostéog., 35.

Caperea antipodarum, Gray; Cat. S. and W., 101.

Hunterius temminckii, Gray; l.c. 98.

Macleayius australiensis, Gray; Trans. N.Z. Inst., VI., 90.

Eubalæna australis, Gray; Cat. S. and W., 91 (as a Cape species); Hector, Trans. N.Z. Inst., V., 156 (as a New Zealand species).

Examination of the type specimens of the foregoing species, into which the common black whales of the southern seas have been divided, confirms the view that there are no sufficient grounds for their separation, and that they should be combined under the name first given to Cuvier's "*Baleine du Cap*."

At the same time I adopt Gray's separation of the genera *Balæna* and *Eubalæna* as necessary on account of the great difference in the form of the skull, in the number of ribs, and the quality and size of the baleen. Thus in *Balæna* the head is one-third of the entire length of the animal, and the maxillaries are enormously produced, so that they are three-fourths of the length of the skull.

In *Eubalæna* the head forms one-fourth of the length, and the beak is only two-thirds the length of the skull.

The number of vertebræ compare as follows:—

	<i>Balæna.</i>			<i>Eubalæna.</i>		
Cervicals	7	..	..	7
Dorsals	13	..	..	15
Lumbers	10	..	..	10
Caudals	23	..	..	27

Although the fine skeleton of *Balæna mysticetus* in the Brussels Museum shows a rudimentary fourteenth rib on the left side, the number of dorsal vertebræ in that species never exceeds thirteen, while fifteen is the constant number present in *Eubalæna*.

Balæna antipodarum was the name given by Gray to a whale of which only a sketch was preserved, taken by Major Heaphy, V.C., from a specimen stranded in Jackson Bay, Tory Channel, in 1839,* and the same name has been given to a fine skeleton in the Museum at Paris, obtained in Akaroa Harbour by Captain Berard and Dr. Arnoux of the French corvette "*Le Rhin*." The length of this skeleton is 45 feet, the skull being 13 feet, and

* Dieffenbach's New Zealand, I., 44.

in the same museum is the type specimen of *Eubalæna australis*, from the Cape of Good Hope, which is 49 feet in length, the skull measuring $14\frac{1}{2}$ feet. In both skeletons the number of dorsal and lumbar vertebræ is the same, but in the former only nine caudal vertebræ have chevron bones and twelve are without, while in *Balæna australis* thirteen have chevron bones and there are twelve without, thus having four more caudal segments than in the New Zealand specimen; but as the few other divergent characters of the two skeletons are within the limits of individual variation, it is probable that the above difference is due to the imperfection of the shorter skeleton, some of the chevron bones and terminal ossicles having been lost.

The other differences are stated by Van Beneden and Gervais to be as follows:—*

The mandible has a smaller coronoid process but has a better developed articular surface in *B. australis*, and the superior maxillary bone is stronger, and the temporal bone notably more massive. In *B. antipodarum* the beak is a little more curved. There is also a slight difference in the size of the arm bones, and the acromion process of the scapula, present in *B. australis*, is represented only by a tubercle or ridge in the other skeleton.

This latter character cannot, however, be considered as important, for in the same museum is the skeleton of another whale (*Megaptera lalandii*) in which the scapulæ of the opposite sides differ in this respect. After examining the skeletons referred to, and being familiar with the variations presented among the bones of the same species scattered about the whaling stations on the New Zealand coast, I do not attach much importance to these distinctions, but at the same time it must be noted that in the skeleton of a black whale obtained on the coast of Canterbury by Dr. von Haast, and now mounted in the British Museum as the type of *Macleayius australiensis*, Gray, the total number of vertebræ is also 54. The strong curvature which has been given to the vertebral column in mounting this fine skeleton, gives it, at first sight, a very different aspect from the Paris specimens, but closer examination proves it to agree closely in all characters but the number of terminal caudal ossicles, with *Eubalæna australis*.

In the Dunedin Museum, the skeleton of a young black whale obtained on the Otago coast, has been mounted by Professor Hutton, and he informs me that in this specimen also the number of vertebral segments is 54.

The smaller number of vertebræ thus appears constant in the only three complete skeletons of the New Zealand *Eubalæna* which are available; whereas in the skeleton of the Cape *Eubalæna*, of which there are two in Paris, old and young, one young at Leyden, and one, also young, in the

* *Loc. cit.*, p. 53.

College of Surgeons Museum, London, the number varies from 56 to 59. But Cuvier's original description of the Cape whale gives the number of vertebræ as 49, with 14 chevron bones;* and it is probable that the number of rudimentary tail bones is unimportant, as they are very likely overlooked in some cases, and left enclosed in the tough caudal integument when the skeleton is being stripped.

As the whalers only recognize one kind of black whale, which is common throughout all southern seas, and there is no difference in habits, food, or distribution in latitude observable among them, it does not seem necessary in the present state of our knowledge that the New Zealand and the Cape species should be considered as different.

NOTE.—27th Feb. Since writing the above, I have had an opportunity of visiting the Otago Museum, and I find that the skeleton of *E. australis* above referred to is evidently incomplete, and that the number of vertebræ is not to be taken as a reliable character.

	MEASUREMENTS.			Ft.	In.
Total length	29	1
Length of skull	7	3
Width, orbital	5	6
„ exoccipital	2	6
Height of arch of skull	3	4

The vertebral column as mounted consists of—Cervical, 7; dorsal, 15; lumbar, 10; and caudal, 22; but the latter region is imperfect, and is partially restored artificially.

The condition of the cervical region is interesting. The first to the fifth segments are united by the spinous processes and laminae; and the third and fourth, on the left side only, by the tips of the inferior lateral processes. Otherwise the vertebræ are distinct.

Only 14 pairs of ribs have been mounted, but, as they are not in relative position, the number is probably also erroneous, and should, from the appearance of the vertebræ, be 15 on each side.

Only a few of the chevrons are present, but, to judge from the presence of facets for their attachment to the centra, they were 13 in number, being attached from the 33rd to the 46th vertebræ. The 39th to the 45th have the lateral processes perforated, but the characters of the caudal region are not reliable.

The scapula agrees with that of *E. australis* in the Paris Museum, and not with *E. antipodarum*, in having a well-developed acromion process.

In the same museum is a skull and the scapula of another specimen of this whale, but of much larger dimensions, which agree in their characters with the foregoing.

3. MEGAPTERA LALANDII.

Megaptera lalandii, Fischer; v. Beneden and Gervais, *Ostéog.*, 133.

Poescopia lalandii, Gray; *Cat. S. and W.*, 126.

Megaptera novæ-zealandiæ, Gray, *Cat. S. and W.*, 128; Hector, *Trans. N.Z. Inst.*, V. 156, VII., 255.

Although the humpback is the most common whale round our coasts, a complete skeleton of a New Zealand specimen is still a desideratum. From

* Gray, *Cat. S. and W.*, p. 92.

the comparison of the skulls described in my former paper, one of which is now in the British Museum and the other in the Colonial Museum, with the type from the Cape of Good Hope in the Paris Museum, which is described and partly figured by Van Beneden and Gervais, I feel no hesitation in identifying the New Zealand humpback with that from the Cape.

4. PHYSALUS AUSTRALIS.

Physalus australis, Desmoulins; Diet. Class. H.N., II., 166.

Balænoptera australis, Gray; Zool. Er. and Terr., pl. 51.

Sibbaldius antarcticus, Gray; Cat. S. and W., 381.

Balænoptera antarctica, v. Beneden and Gervais, Ostéog., 234.

? *Physalus grayi*, McCoy; Zool. and Palæont. of Victoria, p. 4.

? *Sibbaldius sulphureus*, Cope; Proc. Phil. Acad., 1869, 20.

Stenobalæna xanthogaster, Gray; Ann. and Mag. N.H., 1874, 305.

Physalus australis, Hector; Trans. N.Z. Inst., V., 157, VII., 257.

The complete skeleton, seventy feet in length, of the great southern rorqual described in my former paper* has now been mounted in the Colonial Museum, and there are no osteological characters by which it can be distinguished from the great northern rorqual (*Physalus antiquorum*, Gray, or *Balænoptera musculus*, Van Beneden and Gervais) of which I have examined skeletons in the museums at London, Edinburgh, and Turin.

In its external characters, and especially in having a small dorsal lobe situated far back, instead of the high erect fin so characteristic of the northern *Physalus*, it resembles the broad-nosed fin-whale (*Physalus sibbaldii*) figured by Turner,† but the short pectoral limbs, the form of the skull, and the number of vertebræ, 64,‡ its fifteen ribs and great size readily distinguish it from the genus *Sibbaldius* of the rorquals, which have 56 vertebræ and fourteen ribs and expanded maxillaries.

As there is no other complete skeleton of the southern rorqual yet described, and the various species above quoted from the South Seas and the Pacific Ocean have been founded on very fragmentary evidence, I think it better to combine them under the name by which the razorback was first recognized in the south.

The specimen in the Melbourne Museum, quoted from Professor McCoy, appears to be the same, but it is not yet fully described, the chief point of difference noted being that it has 16 and not 15 ribs, which is the number in other skeletons of the species.

Sibbaldius sulphureus, Cope, is only named from descriptions and drawings, and I have suggested it as probably the same as the southern species, on account of the resemblance of a skeleton which I obtained in San

* Trans. N.Z. Inst., 1875, VII., 257. † Trans. R. Soc. Ed., XXVI., 197.

‡ By an oversight the number of vertebræ was formerly given as 57, the seven cervicals not having been included. "Trans. N.Z. Inst.," VII., 259.

Francisco, and which I have reason to think was that of the whale referred to in Professor Cope's description; but only a very cursory examination could be made of this skeleton while I was packing it for transmission to the British Museum, where it is now deposited.

5.—BALÆNOPTERA HUTTONI.

Balænoptera huttoni, Gray; Ann. and Mag. Nat. Hist., XIII., 450.

Physalus antarcticus, Hutton; Ann. and Mag. Nat. Hist., XIII., 316.

This is the pike whale of the southern seas and is hardly distinguishable from the northern *Balænoptera rostrata*. The genus *Balænoptera* is here restricted to the small rorquals, which have less than 50 vertebræ and 11 pairs of ribs. The type of *B. huttoni* is in the British Museum, but was not mounted when I examined it. The second and third cervicals show marks of adhesion, and specimens of these vertebræ in the Colonial Museum are as firmly anchylosed as in *B. rostrata*.

6. PHYSETER MACROCEPHALUS, LINN.

Catodon australis, Gray; Cat. S. and W., 206; Hector, Trans. N.Z. Inst., V., 158.

Meganeuron krefftii, Gray; Cat. S. and W., 387.

Catodon colneti, Gray; Cat. Cetac. B.M., 52.

Physeter polycyphus, Q. and G.; Uran. Mamm., t. 12.

The sperm whale is ubiquitous in warm seas and occasionally roams into high temperate latitudes. It is represented in almost every museum by fragmentary or complete skeletons presenting variations due to age, but there appears to be no ground for distinguishing more than one species which has the name originally given by Linnæus.

7. KOGIA BREVICEPS.

Physeter breviceps, De Blainville; Ann. d'Anat. et de Physiol., 1838, II., 337.

Kogia breviceps, Gray; Cat. B. M. Cetacea, 1850, p. 53.

Physeter simus, Owen; Trans. Zool. Soc., VI., 30.

Euphysetes grayi, Macleay; Gray, Supp. Cat. S. and W., 392.

Kogia macleayi, Gray; Cat. S. and W., 218.

Euphysetes macleayi, Krefft; Proc. Zool. Soc., 1865.

Euphysetes pottsii, Haast; Trans. N.Z. Inst., VI., 97.

? *Kogia floweri*, Gill; Amer. Nat., IV., 738.

This very remarkable and diminutive form of the *Physeteridae* has probably a similar range to the sperm whale, but only one instance is recorded of its occurrence north of the equator. Professor Gill describes a specimen from Mazatlan on the coast of Mexico, which is probably the same species. The other specimens have been taken in the seas off the Cape, Australia, and New Zealand, and there does not appear to be any reason for making several distinct species, as the only complete skeletons agree in all essential characters.

8. BERARDIUS ARNUXII, *Duvernoy*.

Plate XVI.

An adult male of the porpoise whale was captured in the entrance to Wellington Harbour on 12th January, 1877, and the complete skeleton has since been mounted in the museum.

The condition of the terminal epiphyses of the vertebræ and limb bones shows it to be of more mature age than the specimen of slightly larger size forwarded to the College of Surgeons Museum by Dr. von Haast, in 1868,* which Prof. Flower has made the subject of a most exhaustive and masterly memoir.† The external form of this whale is shown in the accompanying outline sketch (plate XVI.) which was made by careful measurement. The colour was black with a purple hue, except a narrow band along the belly, which was grey. The muzzle, flippers, and tail lobes were intensely black. The snout was flattened above and the lower jaw projected two inches beyond the upper, which was received into firm fleshy lips. The interior of the mouth was of a dark slate colour. The teeth did not penetrate the gums, nor could their position be discovered till deep incisions were made.

The blow-hole was on the vertex of the head directly over the eye, with a rounded protuberance in front. The flippers were stout and rigid, and there were no axillary folds of skin to indicate great freedom of motion.

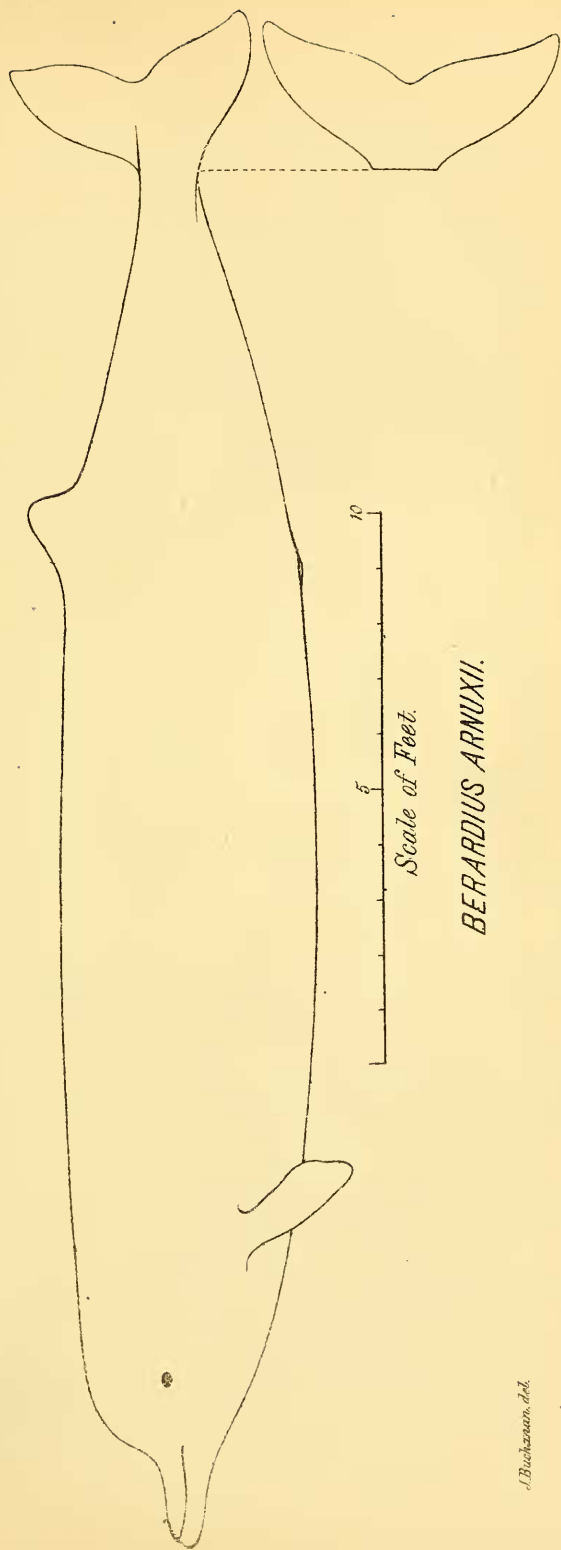
The form of the body was cylindrical and of nearly uniform size between the flippers and the vent. The dorsal fin, which commenced over the vent, was thick and rigid with a thin rounded edge. The tail lobes were broad and powerful.

					Ft.	In.
Total length	..	..	..	..	27	6
Extreme girth at middle	..	..	..	..	15	0
Snout to eye	..	..	..	..	2	11
Snout to blow-hole	..	..	..	..	3	6
Length of gape	..	..	..	..	1	8
Anterior border of flipper	..	..	..	..	2	7
Snout to root of flipper	..	..	..	..	5	2
Snout to dorsal fin	..	..	..	..	18	0
Length of base of dorsal fin	..	..	..	..	2	0
Height of dorsal fin	..	..	..	..	0	10
Expanse of caudal flukes	..	..	..	..	5	3

The skeleton agrees in most of the details with that described by Prof. Flower. The teeth are two on each side near the tip of the lower jaw, the anterior being the larger, and agreeing in form with the single tooth found on each side of the jaw of the specimen captured at the same place in January, 1870.‡ The skull of that specimen is in the museum, and agrees in every

* Trans. N.Z. Inst., II., 190. † Trans. Zool. Soc., VIII., 203.

‡ Trans. N.Z. Inst., III., 129.



BERARDIUS ARNUXII.

J. Buchanan, del.

respect with the one under consideration, so that there is no doubt that the presence or absence or relative position of the rudimentary teeth in the ziphioid whales is a matter of no specific value, contrary to the assertion of Dr. von Haast.*

The three first cervicals only are anchylosed, as described by Prof. Flower, but the neural arches of the posterior cervicals are complete and not open, which is one point of difference between the two skeletons.

The total number of vertebræ is 47, or one less than in the College of Surgeons specimen, and yet extreme care was taken to secure the whole of the small tail bones. There is also a slight difference in the number of vertebræ in the regions of the spinal column, as described by Prof. Flower, from the skeleton now in the Colonial Museum, thus:—

	FLOWER.				COL. MUS.		
Cervicals	7	..	..	..	..	7
Dorsals	10 †	..	..	..	..	10
Lumbers	12	..	..	..	..	13
Caudals with facets for chevrons	12	..	..	..	..	10
Tail proper	7	..	..	..	..	7

Only the six last chevron bones were present, being attached to the 36th–42nd vertebræ, and although the four preceding vertebræ, 31st–35th, have distinct hæmal facets, none of the corresponding bony arches were present. It is useful to note such discrepancies, as showing the amount of individual variation which may exist in the same species.

The number of phalanges in the digits of the manus, which Prof. Flower suggests were imperfect in his specimen, are in my specimen I.–1, II.–6, III.–5, IV.–4, V.–3.

9. MESOPLODON HECTORI.

Mesoplodon hectori, Gray; Ann. and Mag. Nat. Hist., VIII., 117.

Plate XVII.

It is very doubtful if this species should be separated from *M. sowerbyi*, De Blainville, which seems to be subject to great variation in the position and development of the mandibular teeth, the length and basal width of the beak of the skull, and the presence or absence of a meso-rostral callosity. There appear, however, to be two extreme forms in the New Zealand seas, one representing the type of *M. sowerbyi*, of which the skull in the Canterbury Museum, which I formerly described as a variety of *M. hectori*, † is probably an instance; but a still more extreme form in the same direction of development is found in a skull in the Otago Museum, of which I am

* Trans. N.Z. Inst., IX., 455.

† Twelve thoracic vertebræ are mentioned in the text, though elsewhere described as ten, l. c., p. 226.

‡ Trans. N.Z. Inst., V., 168.

able to give a figure (plate XVII.) from a photograph which I had taken by permission of Prof. Hutton. The other group, of which the type of *M. hectori* is an extreme though very young example, represents the forms similar to *M. europæus* of the northern seas.

These extreme forms are separated, but with many intermediate examples, chiefly on account of the position and size of the tooth in the mandible, a character to which I think too much importance has been attached, as no two specimens yet obtained agree perfectly in this respect.

The complete skeleton of an adult male of *M. hectori* which I obtained in Lyall Bay, near Wellington, in January, 1875,* agreed perfectly with those parts which had been preserved by the late Dr. Knox of the type of the species from Tetai Bay, Porirua Harbour, but in this second case the teeth were situated several inches from the tip of the mandible, while in the type they were at the extreme tip, though still lateral and not terminal as in *Ziphius*.†

Again, in the very young specimen of which I obtained only the lower jaw from Kaikoura, the teeth were opposite the hinder edge of the symphysis.‡

Dr. von Haast has lately described under a new genus *Oulodon*§ three specimens obtained by Mr. Hood in the Chatham Islands of a *Mesoplodon*, which has a row of small teeth in the upper jaw, in a position corresponding to the shallow emargination of the upper part of the ramus of the mandible of the Otago Museum skull (*a. fig. 1, pl. XVII*). No anatomical description of *Oulodon* has yet been published, and as the characters of the skulls figured and described by Dr. von Haast were concealed by the dried integument, its exact affinity to the other species of *Mesoplodon* cannot be detected; but, while the longest of the skulls (No. 1) has the mandible produced to three times the width between the articulations (computed from the orbital width which is given by Dr. von Haast) and the teeth at one-third the length of the mandible from the tip, in both of which characters it again agrees with the Otago Museum skull, the shorter skull (No. 3) has the length of the mandible only twice the articular width, and the tooth at one-fourth the length of the mandible from the tip, thus approaching *M. hectori* in its proportions.

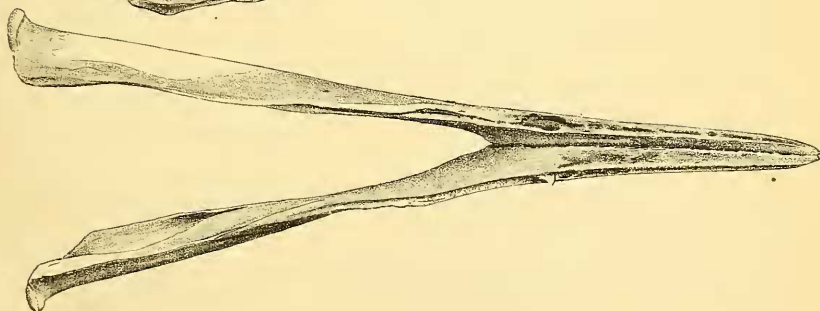
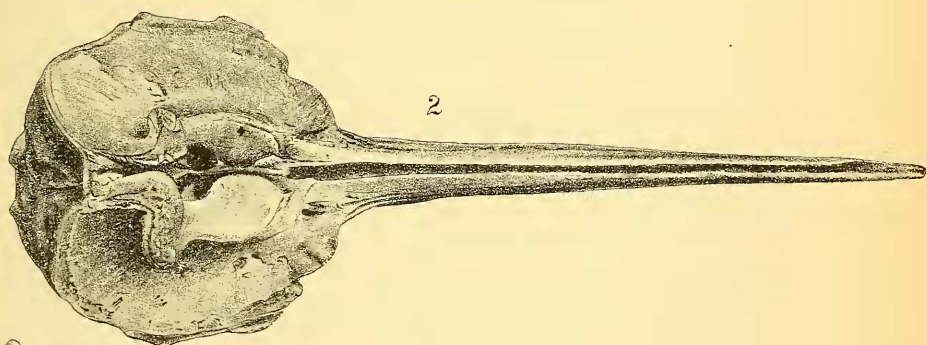
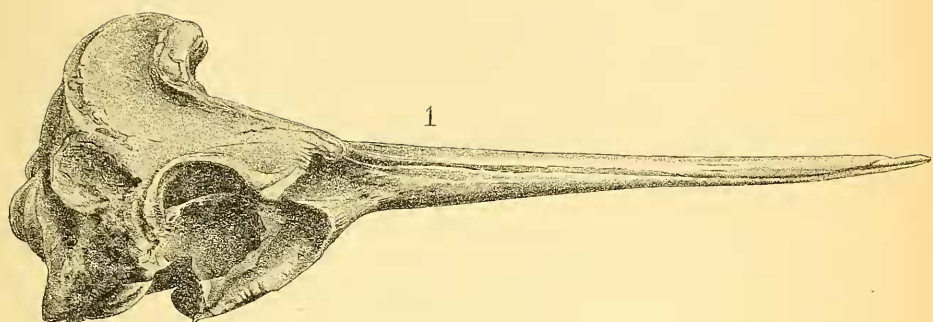
The presence of rudimentary teeth in the upper jaw of *Mesoplodon* is certainly a most interesting discovery, but the animals have so seldom been examined in the flesh that it may not prove to be of uncommon occurrence, although it has escaped the notice of all naturalists prior to Dr. von Haast.

* Trans. N.Z. Inst., VII., 262.

† Trans. N.Z. Inst., III., pl. 14, 15.

‡ Trans. N.Z. Inst., VI., pl. 15a.

§ Trans. N.Z. Inst., IX., Art. LVI.



MESOPLODON HECTORI.

J.B. lith.

Similar teeth in the gum of the upper jaw have, however, been previously recorded for the closely-allied *Ziphius cavirostris*; but, as Professor Turner remarks in describing a skull of this species found in Shetland, "such teeth are quite rudimentary and functionless, and the presence or absence of such aborted organs ought no more to form the basis for establishing a specific difference, than should the entire absence of teeth both in the upper and lower jaw of the Shetland cranium be a reason for regarding it as a distinct species."*

10. MESOPLODON LAYARDI.

Dolichodon layardi, Gray; Cat. S. and W., 353; Hector, Tr. N.Z. Inst., V., 166.

Dolichodon traversi, Gray; Trans. N.Z. Inst., V., 96.

Mesoplodon layardi, Flower; Nature, VII., 368.

Mesoplodon floweri, v. Haast; Trans. N.Z. Inst., IX., 442.

Only five or six examples of this curious and generally supposed abnormal form of ziphioid have yet been met with, and of these I have seen four, (1) a lower jaw from the Cape of Good Hope, collected by the Challenger Expedition, (2) a lower jaw I have already described from the Chatham Islands,† (3) the complete skeleton in the Canterbury Museum, a very complete anatomical description of which has been given by Dr. von Haast,‡ and (4) the skeleton in the Sydney Museum, which has been made the type of a new species, *Mesoplodon guntheri*, Krefft, but which Professor Flower considers to belong to the species now under review.§

In the last specimen the teeth are not so fully developed into the wonderful strap-shaped arches as in the type, but they are evidently intermediate in their form between it and the triangular tooth of *M. sowerbyi*. *This skeleton has not been yet described, I believe, but Mr. Scott states || that he has compared it with the drawings of the skeleton of *M. sowerbyi* given by Van Beneden and Gervais, and cannot detect any essential difference of structure between them. The other species I have seen, although each has received a different specific name, are only distinguished by a slight divergence in the form of the mandible, and the manner in which the large abnormal tooth or rather *tusk* has been bent or worn, which characters are obviously due to individual variation.

The skeleton described by Dr. von Haast is of a mature and probably an aged animal, and as the other specimens that have large tusks correspond in size, and the osteology in most points agrees with other Mesoplo-donts, it is not improbable that it may be only the aged condition of some species already known from immature individuals. Dr. von Haast states

* Trans. Roy. Soc. Edin., XXVI., 769.

† Trans. N.Z. Institute, V., 166.

‡ Trans. N.Z. Inst., IX., Art. LV.

§ Nature, VII., 368.

|| Mamm. Recent and Extinct, p. 116.

that it is the only ziphioid whale that has three cervical vertebræ anchylosed and four separate;* but *Berardius* has this character, and the two skeletons of *M. hectori* differed in this respect, one having two and the other four vertebræ anchylosed.

Although it is most probable that the hypertrophy of the teeth in this species is only analogous to the overgrown tusks occasionally met with in wild boars, it may be as well for the present to treat it as a character of specific value until further information is obtained about this whale in its earlier stages of growth.

As an aid to the comparison of the various forms comprised in this most puzzling genus *Mesoplodon*, I have compiled the following table of measurements from the various sources at command:—

	A.	B.	C.	D.	E.	F.	G.	H.	I.	K.	L.
Length of skull ..	28.0	30.0	23.5	29.5	31.0	36.5	37.0 ?	35.0 ?	24.0 ?	41.7	..
„ of cranium	11.5	12.0	8.5	10.5	13.0	13.5	14.5	13.5	9.0	15.7	..
„ of beak ..	17.5	18.0	15.0	19.0	18.0	23.0	22.5	21.5	15.0	26.0	..
„ of mandible	24.5	25.5	19.0	25.5	..	34.0	31.0	30.0	19.0	34.7	32.0
„ of symphyses	7.0	5.2	6.0	6.0	..	14.0	11.0 ?	10.0 ?	5.0 ?	8.0	10.0
Frontal width ..	12.0	12.5	9.5	11.0	11.0	14.0	12.0	12.0	9.5	15.0	15.0 ?
Distance of tooth from tip of mandible ..	8.0	3.0	1.0	4.0	..	11.0	10.5	10.0	5.0	8.7	11.5

A.—*Mesoplodon sowerbyi*, Van Beneden.

B.—*M. europæus*, Van Beneden.

C.—*M. hectori*, Tetai Bay, Colonial Museum.

D.— „ Lyall Bay, „

E.—Skull in Canterbury Museum, no mandible.

F.—Skull in Otago Museum (Pl. XVII).

G.—*Oulodon*, No. I., v. Haast.

H.— „ No. II., „

I.— „ No. III., „

} In these the total length has been estimated from the other proportions.

K.—*Mesoplodon floweri*, Haast.

L.—*M. layardi*, Chatham Islands, Colonial Museum. Breadth computed from distances between articular surfaces.

11. ZIPHIUS CAVIROSTRIS, Cuvier.

Epiodon chathamensis, Hector; Trans. N.Z. Inst., V., 164.

Epiodon novæ-zealandiæ, v. Haast; Trans. N.Z. Inst., IX., 430.

Dr. von Haast has given an elaborate description of the second complete skeleton of this whale yet obtained, the first, which is in the museum at

* *Loc. cit.*, 446.

Buenos Ayres, having been described in detail by Burmeister as *Epiodon australe*.

In European museums this whale is only represented by skulls, the individual specimens of which have generally been distinguished by specific and even generic appellations; but it has been shown by Prof. Turner, of Edinburgh University, in a memoir reviewing the whole subject,* that the distinctions are only founded on changes and developments of the mesoethmoid cartilage, which with increasing age becomes ossified and swollen into different shapes, while at the same time the bony processes surrounding the præ-nasal fossa also undergo change of form; but these differences he considers do not exceed the range of individual variation which is often met with in comparing a series of crania of the same species of animal.

He further shows that the geographical range of *Ziphius cavirostris*, including all known forms, is equal to that of the sperm whale, of which one species only is now generally admitted to exist.

The specific distinction made by Dr. von Haast between the Chatham Island and New Zealand specimens is founded on little more than the form of the teeth, which in the latter specimen, now in the Canterbury Museum, I have formerly pointed out had become absorbed,† only the fangs being left, while in the slightly smaller and probably younger specimen from the Chatham Islands the teeth were still large and serviceable,‡ but such degeneration of the dental apparatus with advancing years is surely not to be taken as a character of specific value.

The only important difference between the descriptions of Dr. von Haast and Burmeister is the presence of one pair of ribs less in the New Zealand skeleton; but this is so violent a departure from the number obtaining in a so closely allied, even if not an identical species, and from the number found in all other ziphioids except *Hyperoodon*, that it should, I think, be attributed to individual abnormality or an accident to the preparation.

One important feature in Burmeister's description has not been alluded to by Dr. von Haast, namely, the presence not only of the large terminal mandibular teeth, but also thirty small teeth in the gum of the mandible and twenty-five on each side in the gum of the upper jaw. As the Buenos Ayres specimen was quite young, measuring only 13 feet in length, whereas the Canterbury specimen was adult, and measured 29 feet, the absence of the functionless teeth in the latter was probably due to the difference of age. This is clearly opposed to the generic value attributed to such organs in the case of *Oulodon*.

* Trans. Roy. Soc. Edin., XXVI., 759.

† Trans. N.Z. Institute, V., 166.

‡ Trans. N.Z. Inst., V., pl. 4 and 5.